Women and Aquaculture in Bangladesh: The Unpaid Labour

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Abstract: *Women labour is considered as unpaid in Bangladesh though they are involved with many income generating activities. Present study was conducted at the six districts i.e. Narail, Khulna, Bagerhat, Mymensing, Chittagong and Barisal of Bangladesh and aimed to assess the women role in aquaculture along with their socio-economic status and access to the resources. The methodological approach included data collection using a blending of techniques of focus group discussion (FGD) and a direct questionnaire survey of 88 respondents. The study reveals that most women's are involved in fish poly culture. The analysis shows that the general tendency of women being involved generally by liming, feeding, regular supervision, medication, pond drying, harvesting, marketing, seed supply and trading processes. Current study concluded that women access to different options at the society is limited.*

Key-Words: Women, aquaculture, fish, Bangladesh

Introduction

Aquaculture is the fastest growing food-producing sector and is found to be a functional and productive enterprise for both of the poverty alleviation and improvement of nutrition in the world (Bostock*et al.*, 2010). But the sector is underperforming in many countries because of women, who are often a crucial resource in agriculture and the rural economy, face constraints that reduce their productivity. Women involvement in aquaculture and fisheries is common in different continents but the frequency varies based on local, socio-economic and location contexts. Women's role in aquaculture and fisheries is greatly influenced by the caste, religion and position in the family hierarchy. Nandeesha (2004) mentioned gender is now considered as central issue for a number of development initiatives.

Fish farming in the Southwest (coastal zones) Bangladesh has spread rapidly within the last decade among agricultural producers that many of the agrarian institutions there have been carried over and adapted to the new production regime (Ito, 2002). Considering the aquaculture context of Bangladesh, homestead pond fish culture is one of the strongest candidates for small-scale or

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backyard aquaculture which is easily manageable by women besides their daily chores. Though women were engaged in fish processing and feed preparation earlier, there are potentialities to take lead in fish culture by them which will lead to increment of the household income. However gender inequalities comprised of relatively low attention to the work done by women and their limited access to resources, technologies, education, information and skills. Fisheries and aquaculture value chain in Bangladesh keep ample spaces for the women to contribute in the production and income.

The significance and processes of women empowerment are happening to vital in defeating women's subordination. CARE and DANIDA projects in Bangladesh promoted women to maintain activities such as dike cropping, feed preparation and distribution, paddy, poultry, tree, vegetable cultivation and production in Bangladesh (Abedin*et al*., 2001). Because of being nearer to homestead and low investment venture, small-scale fish farming can easily be carried out by rural women. Islam (2005) found that women's participation in income generating activities has increased in recent years. In Bangladesh, men and women are not evenly distributed across all sectors and professions in comparison with their total involvement in the labor force. As a secondary earner or unpaid labor woman has a great potentiality to create opportunity for the household head or male farmers to think for more income for other profession apart from fish farming. Women's growing involvement in aquaculture has been a noteworthy sign for the rapid development of fish farming in rural Bangladesh (Shirajee*et al.,* 2010). Gender roles and responses are largely socially constructed and are the basis for the structure and organization of women and men's differential relationship with their environments, the economy, their resource utilization patterns and strategies (Williams *et al.,* 1997). Women have access to the home gardening considering suitability of the rural chores. If their interaction with the fish culture increases, it will match the criteria and it will be highly sustainable and time saving to manage pond and dike. To ensure equitable benefits for both the men and women it is difficult if inadequate knowledge of the gendered dimensions in fish value chain. Gendered value chain analysis (Mayoux and Mackie, 2008) provides tools to assess the invisible dimensions of these supply chains where women's livelihoods are located. This research looked in details on the status of women to carry out the fish farming activities to design more detail-oriented field intervention in future Bangladesh. Present study was conducted to identify the women roles in aquaculture in Bangladesh.

Materials and methods

Study area

The research was conducted in six districts of Bangladesh i.e. Narail, Khulna, Bagerhat, Mymensing, Chittagong and Barisal (Figure 1). Narail is famous for small-scale fish farming with active participation of male farmers, and Khulna and Bagerhat are renowned for shrimp aquaculture with white fishes and all the actors of fish value chain like, hatchery, feed mill, processing plants, market etc. are established. Mymensing is another aquaculture friendly zone where some sub-districts are

famous for fish culture. Barisal is the riverside area and mostly famous for fish aquaculture and Chittagong is for large-scale fish farming clusters.

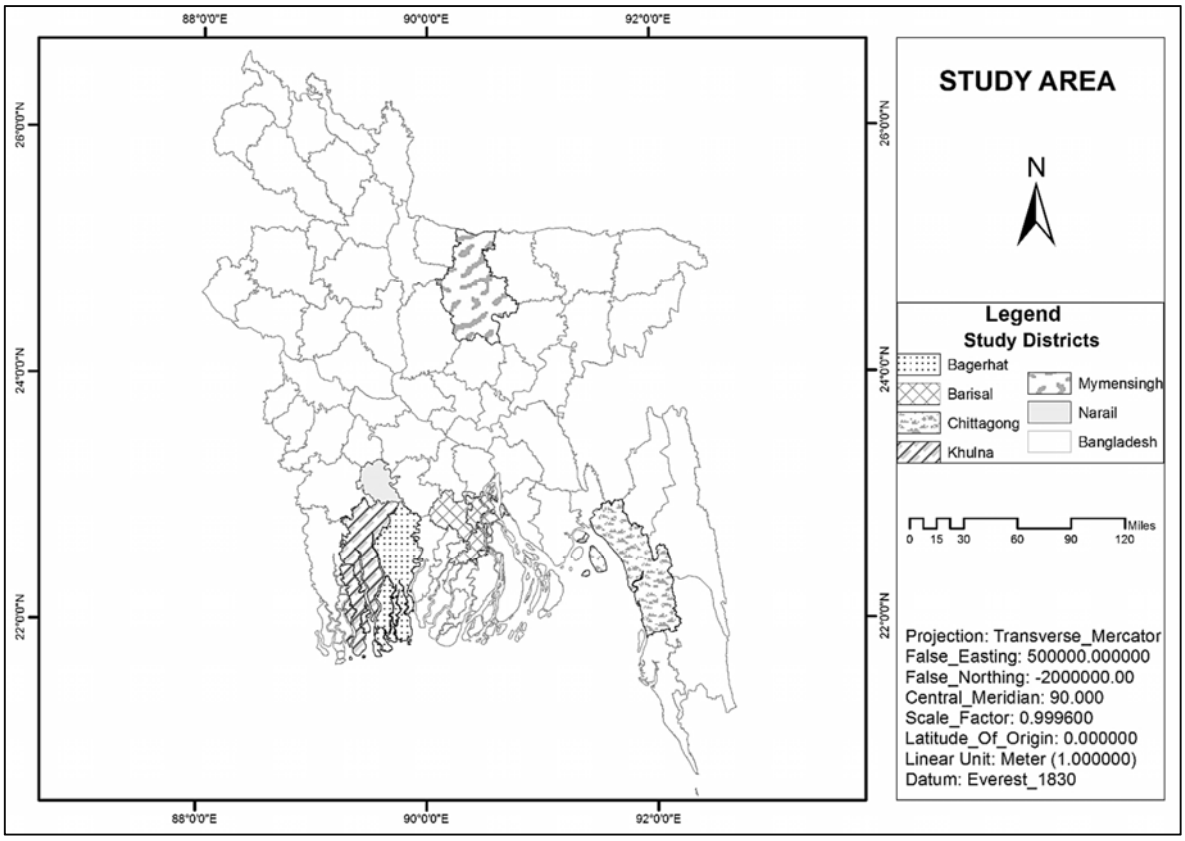


Figure 1: Study Area Map

Data collection and analysis

This study was conducted through a set questionnaire survey& interview of women farmers participating in fish cultivation following the approach of Pido (1995), Pido*et al.* (1996), Townsley (1996), IIRR (1998) and Hossain *et al.* (2009). Questionnaire interviews were conducted with coastal communities household to collect quantitative data. Before conducting the questionnaire survey, a list of local family from the selected study areas was prepared. Questionnaire interviews are suitable for producing perceptions, motivations and feelings (Scrimshaw, 1990). Random sampling was done in the fish culturing areas to select the samples from the above-mentioned location to justify the context. Information for the year 2014 to 2015 has been taken to realize the recent trends. A number of 88 randomly selected samples covering 6 districts namely Narail, Khulna, Bagerhat, Mymensing, Chittagong and Barisal were selected for the present study.

Results

Socio-economic status

Initially the socio-economic status of the interviewee is analysed (Table 1). The family structure of the respondent's resulted in 64.77% of households consists of 5 to 7 members and 18.18% has below 4 members whereas remaining 17.05% belongs to household members 8 to above. Moreover the

educational status of the respondents are not so good where about 40.91% of the respondents are of educational level of class five to eight, about 35.23% of the respondents had studied up to primary school, about 19.32% of the respondent had education level of class nine to secondary level and only 4.55% of the total respondents had education after SSC level. Thus it represents the level of the education and self-soundness of the population due to educational lacking remains.

Further analysis also reveals that the respondents are long being involved with the fish farming practices. A majority of the population started fish farming about 5 to 9 years (38.64%) ago, 27.27% of the total respondents started fish farming more than about 15 years ago. Fish culture in Bangladesh is not intensive rather extensive and semi-intensive in some cases which is justified from the responses that about 93.18% farmers have poly-culture (i.e. various species in same water body) and 3.41% have monoculture (single species in a certain water body) and same percentage (3.41) for the farmers who have both of the practices.

Table 1: ANOVA Table for Women's Role in Aquaculture

	Sumsqrs	Df	Meansqr	F	P
Between groups	0.000123	13	9.48E-06	5.24E-08	1
Within groups	9297.21	3	3099.07	17.1366	2.95E-07
Error	7052.95	39	180.845		
Total	16350.2	55			

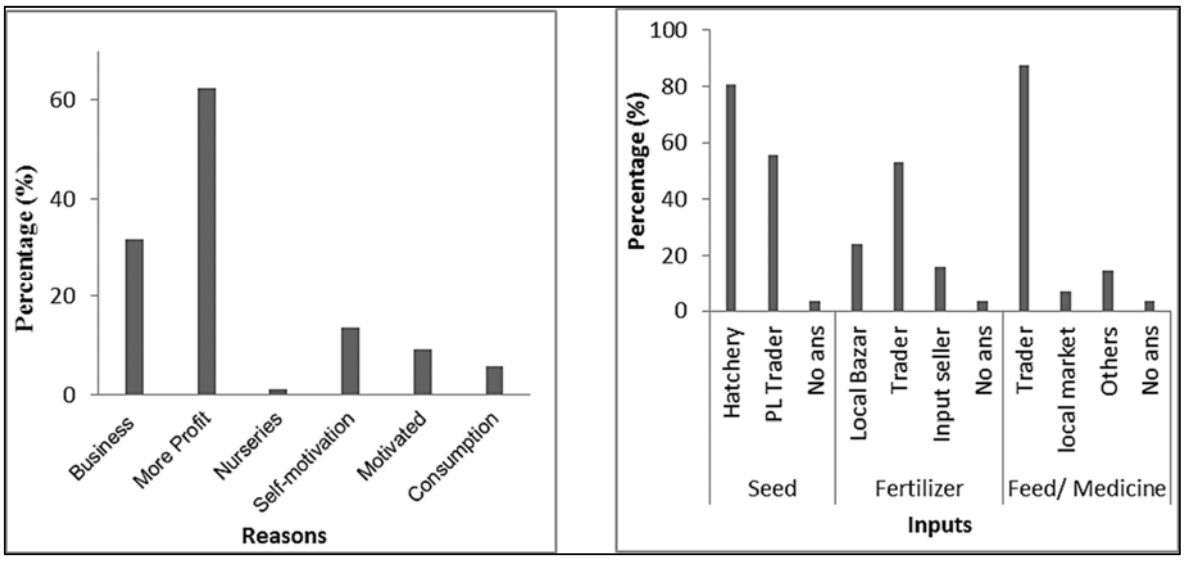
Women in Aquaculture in Bangladesh

The concept of fish culture emerged from different viewpoints. The reasons of the turning towards the fish farming trend has been for formalized and framed in through conducting focus group discussion (FGD) at different sites and the resulted reasons are grouped for the questionnaire survey. The specification and reasons of women being involved in fish farming in Bangladesh has been generalized through the process. Majority (62.50% of Figure 2) of peoples has been involved in fish farming in the tendency of high economic gains, 31.82% began involvement in aquaculture to expand their business (another way to increase income) , only 13.64% motivated by own motivation and remaining 6.82% had a reason for home consumption and convinced by surrounding ongoing culture or nurseries. It is clear through the analysis that due to the socio-economic conditions, women want to get themselves involved in such income generating sectors (aquaculture).

Further analysis resulted whether the helps or influence from other organization have been present to encourage women's involvement. This study reveals that 44.32% of the women respondents collect seeds (Figure 2) from hatcheries and seed traders, 35.23% get it solely from hatcheries, 14.77% buy from seed traders and 2.27% buy it from hatchery and depot. In the whole context, 45.45% women answered that they purchase their fertilizers from trader, dealer and input sellers, 26.14% women mentioned they buy it from local bazaar, 12.50% women collect it from depot and the same

percentage claimed it from depot and/or traders, 3.41% women do not know about their fish farming fertilizer sourcing.

The study also revealed that 84.10% women in fish farming areas of the clusters purchase feed from the traders. 6.82% farmers buy it from both of the traders and depots. 4.54% farmers buy from input sellers and 2.27% fish farmers prepare feed in home and 2.27% women do not know about their feed sourcing. During the survey women were asked about their involvement in aquaculture activity. Responses from interviewee are shown in Figure 4. Women are diversely involved with liming, irrigation, pond drying, embankment, seed management, feeding, daily supervision, medication, harvesting, sorting and grading, packaging and transportation sectors of the aquaculture process (Figure 2).



(a) (b)

Figure 2: Reasons for Starting Fish Culture (a) and Different Available Input Suppliers (b)

About 61.36% women have involvement in liming issue whereas 23.86% women has medium involvement and 22.73% and 14.77% women have high and medium involvement in this regard respectively. 38.64% women do not participate in the liming processes. About 45.45% women take part in irrigation whereas 23.86% involve as medium level, 12.50% low and remaining 9.09% has high involvement, and 54.55% women have no participation in this process. Present study found that 50% of the women involved in pond drying where 22.73% is medium, 14.77% low and 12.50% has high level involvement. About 54.54% women give effort in embankment. 23.86% has medium level of involvement, 17.05% has low and 13.64% has high rank of partaking in this activity. 52.14% women whereas 23.86% low, 15.91% medium and 11.36% high portion involved in this technical activities handling. A significant portion (40.91%) of women has to manage feeding issues at a medium scale in contrast with 21.59% as high and 12.50% as low. On the other hand 79.55% women supervised their pond daily. Among them 37.50% women is in medium scale, 21.59% highly and 20.45% has low

involvement. 20.45% women are in low level whereas 14.77% in medium and 12.50% is highly involved with medicine application. Almost 47.73% women stated that they take part in medication of their pond (Figure 3).

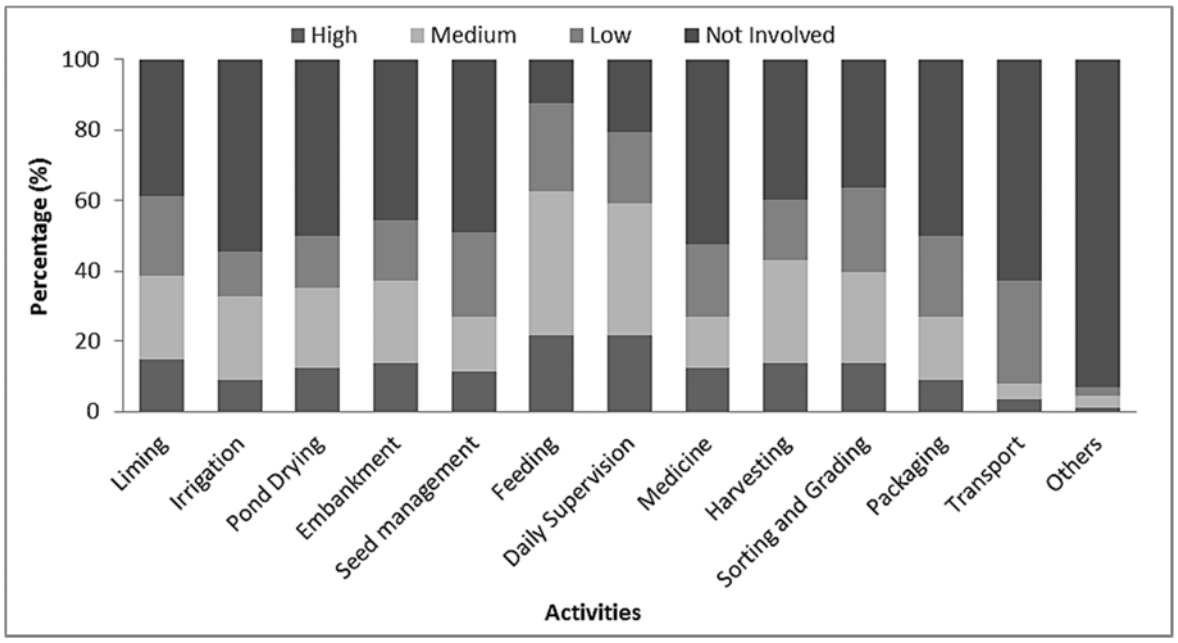


Figure 3: Women Involvement in Different Activities Related to Fish Culture

Beside that 60.23% women claimed that they work in harvesting process, 29.55% have medium level of involvement, 17.05% works at low level and 13.64% women of the whole context have high involvement in fish harvesting processes. 63.64% women are involved in sorting and grading process. 26.14% women involved at a medium level, 23.86% is low and 13.64% women have high involvement in fish sorting and grading activities. Among all the respondents 22.73% women has low involvement, 18.18% has medium and 9.09% women involved highly with packaging.

Figure 4: Women's Involvement in Different Fish Culture Activities

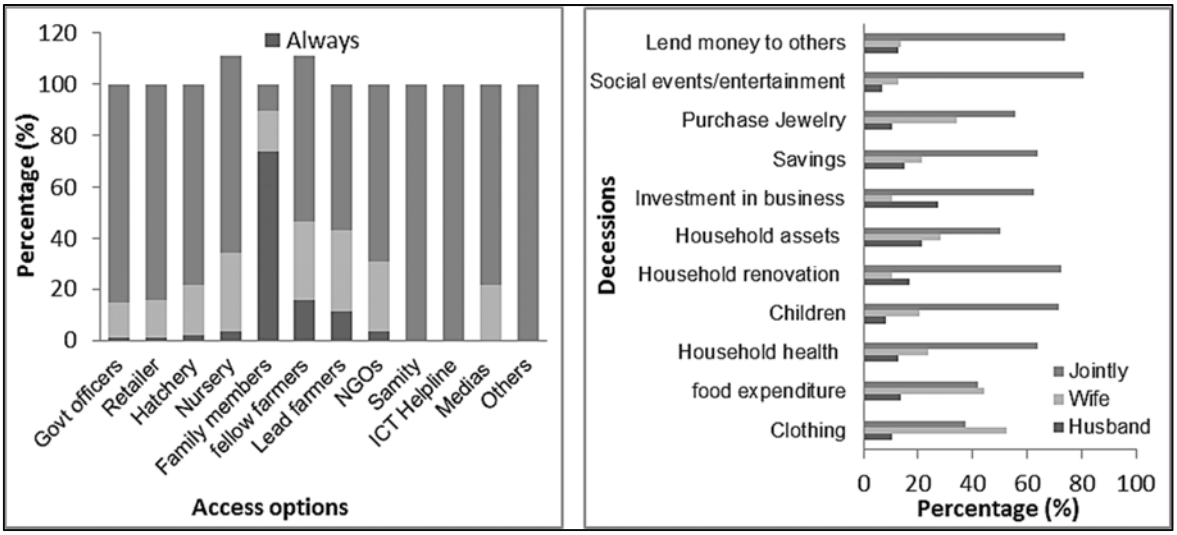
About 37.50% women answered positively to the question of taking part in carrying fish to the transport.29.55% women have low involvement in this issue and only below 9% women have high and medium rank of involvement in fish carrying. Analysis of variance (ANOVA) in table 2 shows no significant difference exist for different levels of involvement but significant difference found among different types of women roles in aquaculture.

Table 2: ANOVA Table for Women's Access to Knowledge and Information in Society

	Sum sqrs	df	Mean sqr	F	P
Between	71.7401	11	6.52183	0.010949	1
Within	31234.1	2	15617.1	26.2177	1.50E-06
Error	13104.7	22	595.668		
Total	44410.6	35			

Women Aqua Farmers in Society

To succeed in fish culture the initiator and his associates should have some technical knowledge - how along with a definite level of information and knowledge source. The women were asked about their access to information and knowledge (Figure 5 a). The tendency to have an access towards husband was seen the highest (73.9%) and it is always done by the women. Sometimes (31.8%) they seek information and knowledge from the lead farmers and fellow farmers (30.7%), nursery (30.7%) sometimes for both, NGO (27.3%), hatchery (19.3%) sometimes, retailer, depot and trader (14.8% sometimes), govt. office (13.6%) sometimes. They always seek information and knowledge from peer and/or fellow farmers (15.9%) and lead farmers (11.4%), 3.4% from nursery, 3.4% from local NGOS and 1-2% from govt. office, retailer, depot and traders. ANOVA in table 3 shows that there is no



significant difference exists among different levels of access to information but significant difference found for different types of access options. The clusters of the context stated that most of the time they take their decisions for household needs jointly (Figure 5 b). But, only two issues such as for clothing and other necessities (52.27%) and for family food related expenditure (44.32%), the women take decision by themselves. 34.05% women in the whole context ranked as second in case of purchasing jewellery and gold items if any. ANOVA in table 3 shows that there is no significant difference exists among different levels of decision making but significant difference found for different types of options.

(a) (b)

Figure 5: Women's Access to Information and Knowledge (a) and Reasons for Decisions (b)

Table 3: ANOVA Table for Women's Independence for Decision Making

	Sumsqrs	Df	Meansqr	F	P
Between	-1.21E-11	11	-1.10E-12	-3.83E-15	1
Within	18042.6	2	9021.29	31.38	3.60E-07
Error	6324.68	22	287.486		
Total	24367.3	35			

Discussions

Kabeer (1988) pointed out that women are quite literally a residual category in the distribution of food, eating after men and usually after children, and making do with what is left. But women contribution in society is undervalued found by Sharma (2003). Currently the women are involved in various facets of aquaculture activities, including stocking of seeds in ponds, feeding of fish, pond management, fertilisation, liming, and fish harvesting and marketing (Shirajee et al., 2010).

General findings are women at the present study area involved in pond preparation which is basically preparing fish culture area by removing wastage soils, weeds and application of lime, fertilizer in the pond bottom and sun drying for water intake. Moreover they are also involved with irrigation and engaged themselves during fish culture to maintain optimum water level or to control physical parameters. Prior to water intake it is done to free pond bottom from toxic gas and to destroy microbial contamination in fish culture. It is a big work and generally done by hiring labour. The pond dikes are constructed to save it from water flow, flood etc. Sometimes it is done in the mid stage of culture if required. Though it is a prerequisite of fish farming, there are some continuous works throughout the culture period for embankment. Management of seeds whether it is fry or post-larvae in case of prawn and shrimp or juvenile, it is essential to stock quality seeds in a quality manner. Prior to stocking it is essential to acclimatize the seeds and fingerlings in pond water. Even nursery is needed in some cases. Seeds should be fed quality-graded feed to get good results which are a part of seed or fingerling management. Pond itself contains some natural feeds which are not enough for a commercial farming. So, feed should be supplied to the fish as floating or sinking, commercial or homemade etc. The fishes have different food habit considering their habitat in different level of the pond. So, commercial packet feeds have different criteria to add value in fish diet.

Women can broadcast commercial or packet feed and can make some feed in home if she has technical know-how. Feed management along with feed preparation, maintaining feeding regime and fixing feed amount etc. are some crucial issues in fish culture. Daily supervision is mainly keeping eye on the pond condition and fish health to ensure the process is going well. Women can easily manage it beside their daily works. If women are engaged with dike vegetation, they have to visit pond daily in regular interval. Routine supervision of pond to protect the fish from predators and monitoring water colour, fish health etc. is also important factors in fish culture. Harvesting is mainly done at the end of the fish cultivation process. Apart from some partial harvesting it is done to catch all the fishes for selling. It is done by hiring daily labour or by participation of all the male members of the family. This is mainly done by male members of the household. Sorting and grading is done after harvesting the fishes. In this regard, it is done in the home yard or on the dike. Women can play role in sorting. Grading is vital in prawn and shrimp farming. In case of fish like *Anabas testudineus*, *Oreochromismossambicus*, Pangasius*pangasius* and *Cyprinuscarpiocarpio* (locally known as koi, tilapia, pangus and carp respectively), sorting is done where women have role to play. Fish carrying in transport is mainly carrying the fishes through container to the van; to the vehicle near farm gate, or in some cases carrying to the local market. Considering Bangladesh social context woman's mobility

is not too wide in rural areas. They usually use bucket or container to carry the fish. It is to mention that the women were asked about taking part in only carrying fish not to take it in market.

Women are thought as co-builders of civilization yet they are underprivileged in many parts of the globe, especially in developing countries such as Bangladesh (Biswas, 2002). Gupta (1990) reported that in Bangladesh, rural women engage in subsistent aquaculture, which has helped in improving the quality of their families' lives. In Bangladesh, women have proven to be competent in adopting aquaculture technologies, despite the fact that their role in aquaculture growth has not been sufficiently recognized and remains inadequately addressed (Shelly and Costa, 2002). Special efforts have not been made to integrate women into aquaculture extension and training programs (Acharya and Benneth, 1982). This research is an example of a comprehensive study using a methodological approach to assess the status of the women involved fish farming community. Through gender lens this study tried to find out issues to the way of aquaculture sustainability. It also revealed economic return and degree of freedom and control over the income of the poor rural women in Bangladesh. The study documented the socio-economic status of fish farming practiced women. Recognizing women's important role in aquaculture development, efforts need to be crafted to design more gender-sensitive projects in Bangladesh. A general sense is that if women can control the aqua-venture fully, man will able to think about something new in outside which will ultimately benefit household. Rural enterprises, microcredit organization and input suppliers can become powerful and sustainable by linking the women with credit, technology, infrastructure, training and trade, such enterprises in improving the livelihoods and economic security of the rural poor. The findings and views from different desks give a conception to establish more gender friendly environment to ensure women's participation in fisheries and aquaculture sector. Building up strong base of gender-disaggregated data for future research is a paramount important point. Supporting the range of function women plays in this sector with appropriate advocacy can bring a positive change to the way of sustainable aquaculture in Bangladesh. Institutional development to linkage women in capacity building could be another important issue in this regard. Policy, planning and programs should be established to ensure women access to resource and services. Strengthening women's role in terms of social, economic and political issues and raising voice and influencing through human capital by developing strategic framework could be the way in forward thinking. Vertical integration of gender mainstreaming in micro-level can bring up women empowerment. Gender issues should be well addressed in education, training and extension along with policy-making. Community-based and participatory rigorous research tool could be effective for further penetration in gender in development issues. Finally, strong gender centric research methodology should be developed to ascertain a strong gender-based aquaculture in Bangladesh.

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